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or

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## ABSTRACT

The present invention relates to fluorinated polyethers having a fluorinated aliphatic group at a main chain as represented by the formula (1), as well as a waveguide fabricated using the same:

$$E = \begin{bmatrix} R_F - Ar_1 \end{bmatrix}_X \begin{bmatrix} O - Ar_2 - O - Ar_1 \end{bmatrix}_Y E$$
(1)

where  $R_F$  represents  $OCH_2(CF_2)_nCH_2O$ , or  $OCH_2CF_2O(CF_2CF_2O)_nCF_2CH_2O$ , where n is a natural number ranging from 1 to 12;

Ar<sub>1</sub> represents F F F , where B is not present or a C=O group, or

Ar<sub>1</sub> represents  $\frac{1}{1}$ , where Hal is one selected from F, Cl, Br and I;

Ar<sub>2</sub> represents , where D is one selected from -  $C(CF_3)_2$ , - $C(CH_3)_2$ , -CO-, - $SO_2$ -, -O- and -S-, or

Ar<sub>2</sub> represents  $(R_2)_{4.m}$ , where  $R_1$  and  $R_2$  are the same or different and each independently represents a halogen atom selected from F, Cl, Br and I, and m is a natural number of 1-3,

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Arz represents

E represents H, or (Rik-m , where P is H or a substituted or unsubstituted phenyl group;

x is a number ranging from 0.1 to 1.0; y is 1.0-x.